

**REMARKS**

The present remarks are in response to the Office Action of March 21, 2006. Claims 1-27 are currently pending. The Applicant acknowledges the removal of all rejections previously issued in favor of the current rejections. Reconsideration of the application is respectfully requested in view of the following responsive remarks directed towards the current rejections. For the Examiner's convenience and reference, the Applicant's remarks are presented in the order in which the corresponding issues were raised in the Office Action.

In the Office Action, the following rejections were made:

- (1) claims 1, 3-11, and 13-20 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat No. 6,177,498 (hereinafter "Rehman") in view of U.S. Pat. No. 6,270,201 (hereinafter "Kasperchik");
- (2) claims 21 and 23-27 were rejected under 35 U.S.C. 103(a) as being unpatentable over Rehman in view of Kasperchik, and further in view of U.S. Pat No. 6,379,443 (hereinafter "Komatsu"); and
- (3) claims 2, 12 and 22 were rejected under 35 U.S.C. 103(a) as being unpatentable over Rehman in view of Kasperchik, and further in view of U.S. Pat No. 5,571,311 (hereinafter "Belmont").

Rejections over Rehman in view of Kasperchik

The Examiner has rejected claims 1, 3-11, 13-20 and 23-27 under 35 U.S.C. 103(a) as being unpatentable over Rehman and Kasperchik. Claims 21 and 23-27 were also rejected under 35 U.S.C. 103(a) as being unpatentable over Rehman in view of Kasperchik and Komatsu. Further, claims 2, 12 and 22 were rejected under 35 U.S.C. 103(a) as being unpatentable over Rehman in view of Kasperchik and Belmont.

Before discussing the obviousness rejections herein, it is thought proper to briefly state what is required to sustain such a rejection. The issue under § 103 is whether the PTO has stated a case of *prima facie* obviousness. According to the MPEP § 2142, the Examiner has the burden and must establish a case of *prima facie* obviousness by showing the prior art reference, or references combined, teach or suggest all the claim limitations in the instant application. Further, the Examiner has to establish some motivation or suggestion to combine and/or modify the references, where the motivation must arise from the references themselves, or the knowledge generally available to one of ordinary skill in the art. The Applicant respectfully asserts the Examiner has not satisfied the requirement for establishing a case of *prima facie* obviousness in any of the rejections.

It appears that in order to resolve a deficiency in the previous rejections, Kasperchik has been added as a new secondary reference to provide the element of high frequency firing to the alleged *prima facie* case of obviousness, which element is required by the claims. In other words, all current rejections rely in part on Kasperchik to provide this claim element that was missing from the previous rejections.

As noted previously, Rehman, the primary reference, discloses latex-containing inks that have a solvent system including at least two solvents, i.e. 3-hexyne-2,5-diol and 1,2-octanediol, which work together to improve the start-up, drop ejection, decap, and high frequency firing of the latex polymer-containing ink-jet inks. Also in the Rehman reference is a laundry list of other potential co-solvents that can be included in the ink-jet ink (as at least a third co-solvent). 1,3,5-(2-methyl)-pentanetriol is one of the many materials included in this list.

The presently claimed invention provides a system for printing images on a substrate, having a black ink-jet ink which includes a liquid vehicle, a methylated pentanetriol co-solvent, a dispersant-functionalized black carbon pigment, and a printhead loaded ink-jet ink and configured to fire at a frequency from 15 kHz to 25 kHz. Rehman, on the other hand, fails to teach of a system or method that can achieve a firing frequency from 15 kHz to 25 kHz. Rehman does teach an ink composition that is capable of being fired at a frequency of "above" 10 kHz, but this is clearly not within the claimed range of 15 kHz to 25 kHz, as set forth in prior office action responses.

Kasperchik has been added as a new secondary reference to provide the element of high frequency firing. Kasperchik, however, does not teach or suggest success of use of either the claimed ink or the Rehman inks with the printing system outlined. Kasperchik teaches a printing system that includes a printhead and an ink composition that provides photographic-quality resolution. The high-density array printhead is said to operate at high frequency, which the patent outlines as 2.25-18 KHz.

Kasperchik obtains photographic-quality resolution through two means: structurally through a printhead and through a specific ink composition. Structurally, Kasperchik teaches using an overdamped structure within the ink drop generators so as to allow the ink chambers to fill up with ink slowly. Additionally, the ink composition is specifically designed to prevent decel. The reference identifies decel as an unwanted result of high-frequency printing bursts decreasing the velocity and stability of ink due to residue on the resistor. To combat decel, Kasperchik presents an ink composition with an aqueous vehicle and a decel-alleviating component. The decel-component is "capable of undergoing rapid thermal decomposition when heated," preferably undergoing exothermic thermal decomposition, is liquid soluble, and preferably includes a salt with reducing or oxidizing capabilities. Kasperchik identifies ammonium nitrate,  $\text{NH}_4\text{NO}_3$  and  $\text{NH}_4\text{NO}_2$  as possible decel-components (see column 14, lines 49-65).

Kasperchik stresses that it is the combination of the disclosed printhead architecture **and** the ink composition, including the decel-additive, that allows for high-speed, high-resolution printing (see column 6, lines 24-26). If anything, this

reference underscores the difficulty of achieving high frequency printing, which the Examiner does not seem to fully appreciate. Regarding the ink specifically, the reference notes that surface tension, viscosity and using the ink composition disclosed will generally ensure "that the ink can successfully be used with the high-frequency printing system of the present invention" (see column 15, lines 5-9).

Therefore, Kasperchik teaches that the use of the ink disclosed is essential to the proper operation of printing at the high frequencies, in this case, up to 18 kHz.

It would not have been obvious by one skilled in the art to use the ink of the present invention, including a liquid vehicle including water, organic solvent including a methylated pentanetriol co-solvent and a dispersant-functionalized black carbon pigment, to achieve high frequency printing, as Kasperchik is very specific as to how to achieve these results. There are specific differences between the ink deemed essential to success in Kasperchik and the ink of the present invention. Most noteworthy is the absence of a methylated pentanetriol co-solvent in Kasperchik (which is very important to the success of the present claims). Methylated pentanetriols are extremely viscous and gooey substances that are inherently more difficult to work with when compared to standard ink-jet ink additives. Furthermore, methylated pentanetriols are certainly not decel-alleviating components per the Kasperchik definition in that they do not undergo rapid thermal decomposition when heated.

As Kasperchik places great emphasis on the ink characteristics, architecture structure, and composition playing a key role in successfully having higher resolution at higher printing speeds, it is a stretch to believe that a person of ordinary skill in the art would find it obvious to print the ink of the present invention in the printing system of Kasperchik with any reasonable expectation of success. Not only are methylated pentanetriols not subject to rapid thermal decomposition when heated, but also they are intuitively unlikely candidates for additives to an ink composition designed for rapid firing in the Kasperchik system due to the highly viscous and gooey nature of methylated pentanetriols. In fact, to compare the highly viscous and gooey substance of the claimed invention with  $\text{NH}_4\text{NO}_3$  or  $\text{NH}_4\text{NO}_2$  is to misunderstand present invention.

Therefore, even if it were in the purview of one of ordinary skill in the art to combine the ink of the present invention with the printhead of Kasperchik, a point not conceded by Applicant, obvious to try is not the same as obviousness. The importance Kasperchik places on the specific combination of the Kasperchick printhead with the specific ink combination indicates a low likelihood of successful high-resolution printing at high-frequencies if the ink is altered, based on a reading of Kasperchik as a whole. Not only, then, would it not be apparent to one of ordinary skill to try the ink of the present invention, one that is quite different in fact from the Kasperchik ink, an expectation of success is even farther removed. The fact that it may be obvious to want to achieve faster firing frequencies cannot be used to render an invention obvious that actually achieves those faster firing frequencies.

Regarding the ink-jet composition of the present invention, specifically independent claim 21, Applicant continues to reiterate that the Rehman reference fails to teach a 3-methyl-1,3,5-pentanetriol compound, and rather teaches incorporating a 1,3,5-(2-methyl)-pentanetriol compound with the ink composition. These two compounds are structurally different. Even though both structures are adjacent homolog structures, this is not the end of the inquiry. It is noted that 3-methyl-1,3,5-pentaintriol is symmetrical, while the 1,3,5-(2-methyl)-pentanetriol is asymmetrical, which can make a difference in organic chemistry as to chemical properties. Thus, irrespective of the allowability of the independent claim, claim 21 is independently believed to be patentable over Rehman, and reconsideration of this claim set is respectfully requested.

*Rejections over Rehman in view of Kasperchik and Komatsu or Belmont*

The Examiner has also rejected claims 21 and 23-27 under 35 U.S.C. 103(a) as being unpatentable over Rehman in view of Kasperchik and Komatsu, and claims 2, 12 and 22 under 35 U.S.C. 103(a) as being unpatentable over Rehman in view of Kasperchik and Belmont. The Examiner has indicated that this obviousness rejection is based on the teaching that Komatsu discloses the use of ammonium salts and Belmont discloses an aqueous ink-jet ink composition having a carbon black pigment resulting in an ink composition size of about 0.06 microns which is within the claimed range of the present invention. The Applicant, however, submits

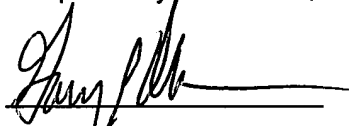
that the rejections concerning the Rehman-Kasperchik reference combination have been overcome as discussed above and these rejections are now rendered moot. This being stated, the Applicant does not agree that these claims are independently unpatentable when viewed against the cited prior art. Reconsideration of these rejections is also respectfully requested.

In view of the foregoing, Applicant believes that claims 1-27 present allowable subject matter and allowance is respectfully requested. If any impediment to the allowance of these claims remains after consideration of the above remarks, and such impediment could be removed during a telephone interview, the Examiner is invited to telephone Bradley Haymond at (541-715-0159) so that such issues may be resolved as expeditiously as possible.

Please charge any additional fees except for Issue Fee or credit any overpayment to Deposit Account No. 08-2025.

Dated this 21<sup>st</sup> day of June, 2006.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Gary P. Oakeson', is written over a horizontal line.

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